



Research Highlight

People can live longer by being physically more activity

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We all know being physically active is good for you. But do we know how good? People can live up to 3 years longer, even with as little as 15 min of physical activity a day, according to last October's report by Wen and his colleagues¹ at the China Medical University in Taiwan, China.

Many researchers in the field of sport and health sciences know being physically active can bring many benefits to one's life. But this message has sometimes been disseminated using a negative tone. So much so, Bortz² of California, USA, has coined the word "inactivity" to describe "disuse" in 1982, and it is widely used in literature today. Just like the old saying, if you don't use it, you lose it. One can lose one's physical capacity too, if not used. This is especially true with advanced age, in addition to what comes with aging. Although we have learned a lot by studying the hazard brought about by being physically inactive, these researches did little to increase the level of physical activity as a whole. Most people have not been scared; despite the tone the information was presented. More and more researchers are trying to present this information positively in recent years. The positive information is presented mainly in the form of reduction of "Hazard Ratio", Wen et al.¹ used this term in their paper too, but most people really have no idea how to interpret "Hazard Ratio". Lately, a few researchers used additional life expectancy to present their results with hope that these results will be easier to digest by the public and motivate more people to change their sedentary life style to a more active one.

In most of the following studies summarized here, additional life expectancy due to physical activity is estimated using Life Table method after following a large group of people for a long time (e.g. 400,000 people, for about 8 years,

in the case of Wen and co-workers¹). Only Byberg et al.³ of Uppsala University, Sweden, used Bootstrap Centile method with 10,000 replications. We will not get into the details of these methods. Readers interested in the methods can easily find this information elsewhere.

Wen's group¹ compared sedentary and low-volume activity populations. Low-volume activity is something like walking the dog for 15 min a day. At age 30, men with low-volume physical activity can be expected to live 2.55 years longer, women 3.1 years longer, compared to a sedentary population. If the activity level is doubled, like walking the dog for 30 min a day, or equivalent, life expectancy at 30 could increase another year and half, according to a report.⁴

These significant benefits of, even low level, physical activity were mainly achieved by reducing the cases of heart diseases, diabetes and cancer.¹

Wen's group surveyed Asian people.¹ Nusselder et al.⁵ of Rotterdam, Netherlands, studied a group of, mainly white, Americans ($n = 4634$, 36 years of follow-up) and reported their results in 2009. At age 50, men with low level of physical activity were expected to live another 26.4 years. Men with moderate/high physical activity would add another 1.3/3.5 years, respectively. For women at age 50, they were expected to live another 32.7 years at low level of physical activity but could add 1.5 and 3.4 years with moderate or high level of physical activity. In Sweden, by following 2205 men for 35 years, Byberg and co-workers³ reported their results on the effects of different levels of physical activity. They also predicted life expectancies at age 50. Men with high levels of physical activity were expected to live 3.8 years longer than sedentary men and 1.8 years longer than men who reported medium levels of physical activity.

Therefore, one can benefit from physical activity whether one is 30 or 50 years old, or lives in Asia, the USA, or Sweden, one's life will be extended.

Nusselder et al.⁵ further parceled their observations in regarding whether or not one has cardio-vascular diseases (CVD). At age 50, men with low, moderate and high level

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physical activity could be expected to live for 19.7, 20.8 and 22.8 years CVD free. Women's data for this comparison were 26.3, 27.6 and 29.6 years. Using the data from the same group (Framingham Heart Study), Jonker et al.⁶ also from Rotterdam, Netherlands, estimated life expectancy and its relation to diabetes. Comparing to data used by Nusselder et al.⁵ this set of data included less people ($n = 2219$), but longer time (46 years). Life expectancy for men (women) with low, moderate and high level of physical activity at age 50 was 25.3 (32.3), 27.1 (34.0), and 29.4 (36.0) years, respectively. Life expectancy, free of diagnosed diabetes, for men (women) with low, moderate and level of physical activity at age 50 were 23.3 (30.3), 25.6 (32.6), and 27.5 (34.2) years, respectively.

In other words, physical activity would make you live longer and suffer less (1–3) years of CVD or diabetes.

The protective effect of physical activity on long life may be partly mediated by its effect on several cardiovascular risk factors. Physical activity has a favorable effect on blood pressure, lipid profile, insulin sensitivity, diabetes, body weight, blood coagulation, and fibrinolysis, and these factors are associated with the risk of cardiovascular disease and premature death. Please see Wang et al.⁴ for more detailed discussion in relation the mechanisms on how physical activities could improve longevity.

The studies reported here are so-called cohort studies — a large group of people have been surveyed multiple times for many years. These types of studies cannot resolve the argument that people live longer because they were healthy so they were physically more active, or if they were physically active,

then they became healthier so they lived longer. So, the results of these studies may not be totally accurate for people who change their life style, let's say from sedentary to low level of physical activity. Large group intervention studies with control groups are needed to see the exact benefits of changing one's life style. But can we really design a study as such? Can we tell a group of people, for the greater good, to please be sedentary for the rest of your life? That might be difficult. The data presented here may not be ideal, but they could be the best we can get.

References

1. Wen CP, Wai JP, Tsai MK, Yang YC, Cheng TY, Lee MC, et al. Minimum amount of physical activity for reduced mortality and extended life expectancy: a prospective cohort study. *Lancet* 2011;**378**:1244–53.
2. Bortz WM 2nd. Disuse and aging. *JAMA* 1982;**248**:1203–8.
3. Byberg L, Melhus H, Gedeberg R, Sundström J, Ahlbom A, Zethelius B, et al. Total mortality after changes in leisure time physical activity in 50 year old men: 35 year follow-up of population based cohort. *Br J Sports Med* 2009;**43**:482.
4. Wang Y, Tuomilehto J, Jousilahti P, Antikainen R, Mähönen M, Katzmarzyk PT, et al. Occupational, commuting, and leisure-time physical activity in relation to heart failure among finnish men and women. *J Am Coll Cardiol* 2010;**56**:1140–8.
5. Nusselder WJ, Franco OH, Peeters A, Mackenbach JP. Living healthier for longer: comparative effects of three heart-healthy behaviors on life expectancy with and without cardiovascular disease. *BMC Public Health* 2009;**9**:487.
6. Jonker JT, De Laet C, Franco OH, Peeters A, Mackenbach J, Nusselder WJ. Physical activity and life expectancy with and without diabetes: life table analysis of the framingham heart study. *Diabetes Care* 2006;**29**:38–43.